



Green Knowledge Management Strategies and Employee's Green Performance of Selected Small and Medium Enterprises (SMEs) in Anambra State, Nigeria.

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Abstract

This study investigated the effect of green knowledge management strategies on employees' green performance of selected Small and Medium Enterprises (SMEs) in Anambra State, Nigeria. The study is grounded in the knowledge-based view theory, which emphasizes the generation of knowledge within the organization for gaining a competitive advantage. The research design method adopted was descriptive survey design. With a total population of 1,200 staff of 10 selected SMEs, the sample size of 291 was drawn applying the Krejcie and Morgan (1970) table of sample size determination. The research instrument applied was a structured questionnaire, and a simple random sampling technique was adopted in the administration of the questionnaire. The instrument's reliability was confirmed with a Cronbach Alpha (α) index. Data analysis was conducted using Pearson correlation and Ordinary Least Squares (OLS) multiple regression via SPSS version 22. Findings revealed strong, positive, and statistically significant relationships between all green knowledge management components and employees' green performance. Notably, green knowledge acquisition had the most substantial effect ($\beta = 0.592$), followed by knowledge sharing ($\beta = 0.226$) and knowledge creation ($\beta = 0.138$). The study concludes that green knowledge management significantly enhances employees' green performance in SMEs and recommends policies that will encourage green knowledge management practices among SMEs in Anambra State.

Keywords: Green Knowledge Management, Green Knowledge Creation, Green Knowledge Acquisition, Green Knowledge Sharing, Employee Green Performance. Small and Medium Enterprises (SMEs)

Introduction

Recently, employee green performance has become a burning issue in environmental management and sustainable economic development (Hien, 2025). As the world struggles to combat the challenges posed by environmental degradation, organizations are desirous, including individuals making frantic efforts to improve their green knowledge and skills and to come up with innovative ideas to solve the myriads of environmental issues and implement eco-friendly initiatives for business continuity. This requires creativity and collaborative efforts, as technological development has

evolved to aid or complement human efforts (De Barros et al., 2025).

Employee performance is a multifaceted concept that has no clear-cut definition (Ghalem et al., 2016). It refers to the effective and efficient use of experiences, knowledge, skills, and talents to carry out specified tasks and to achieve organizational objectives (Alghamdi, 2021). Performance is perceived in terms of commitment to achieving eco-friendly objectives and sustainable development (Gomes et al., 2024). An employee's performance cannot be evaluated unless there is a standard of measurement. This standard is usually set by the organization to enable it to appraise

the workers. This becomes very important since employee performance to a great extent determines organizational performance (Yang & Li, 2023). Employee job performance is mainly measured by quantity (amount of work) and quality (how well they do compared to peers), using self-reported performance data (Arulrajah et al., 2016). The quantity and quality of work done to preserve the environment for sustainable development is referred to as employees' green performance.

In today's fast-changing world, knowledge is the key driver of organizational operations, ensuring a firm's survival and profitability (Wyszkowska-Kuna, 2020) and promoting innovation, productivity, sustainability, and overall organizational success (Ngoc Huynh et al., 2024). To achieve success and guarantee sustainability, organizations are expected to focus on improving the performance of employees, as it determines the overall success of the organization (Alghamdi, 2021). This requires effective knowledge management practices such as knowledge creation, acquisition, and sharing. Green knowledge management (GKM) has become crucial for gaining a competitive edge, as it impacts employees' environmentally friendly performance (Khan et al., 2024). According to El-Kassar and Singh (2019), as referenced by Polas et al. (2021), the key knowledge management factors influencing SMEs' adoption of green innovations are knowledge acquisition, sharing, and responsiveness. Al-Faouri (2023) identified five dimensions of the green knowledge management process, which include knowledge acquisition, storage, dissemination, utilization, and creation. A situation whereby tacit knowledge, which is a personalized and undocumented knowledge (Gamble, 2020), is formalized, communicated, and made understandable through some form of documentation or explanation, creates knowledge (Corcione et al., 2024). To achieve organizational objectives, knowledge needs to be acquired by individuals and groups within the organization. Knowledge acquisition is the process of acquiring and disseminating information on environmentally sustainable methods, concepts, and technologies (Baquero, 2024). Its sources could be internal or external (Wyszkowska-Kuna, 2020). The knowledge acquired is expected to be disseminated among critical stakeholders in the organization for the implementation of environmental protection objectives. Sharing knowledge is all about putting into practice the knowledge about environmental protection (Widyanti et al., 2024). This knowledge must be nurtured, properly organized, and preserved for ease of retrieval. This, according to Abu Rumman and Hiasat (2023), is referred to as knowledge storage. According to Al-Faouri (2023), ecological information and technologies

have to be utilized for the purpose of protecting the ecosystem.

Despite the role of SMEs in driving the economy (Gherghina et al., 2020), many now struggle to enshrine green practices into their operations, perhaps due to a dearth of green knowledge management strategies. This makes it difficult for employees to practice eco-friendly behavior, thereby affecting organizational sustainability and competitiveness. Against this backdrop, this study examines the relationship between green knowledge management strategies and employees' green performance in selected SMEs in Anambra State, Nigeria.

Review of Related Literature

Theoretical Underpinning- Knowledge Based-View (KBV) Theory

The theory of knowledge-based view (KBV) of the firm was rooted in the stakeholder theory, resource-based view (RBV) of the firm, and organizational theory (Parekh & Wright, 2024). Leveraging the RBV theory, KBV proposed that knowledge generated within the organization is a veritable asset that can be used as a source of competition within the industry (Khan et al., 2024) since knowledge, particularly tacit knowledge, can't be easily imitated or copied by the competitors (Gamble, 2020). Furthermore, knowledge resources in SMEs are built over the years, thereby enhancing their performances, sustainability, and maintenance of competitive advantage (Olubiyi et al., 2024). The knowledge held in an organization is an important resource that influences organizational success—performance, competitive advantage, and sustainability (Igbakoyi et al., 2024). This presupposes a nexus between organizational capacity to retain competitive advantage and effective resource (knowledge) management. According to KBV, enterprises are structures that synthesize knowledge resources and coordinating mechanisms into profitable tasks of the firm's core abilities (Parekh & Wright, 2024). The deployment of information technologies and its linkage with knowledge management practices have been found to improve knowledge creation, acquisition, and sharing, thus improving their performances (Alemu, 2025).

Conceptual Review of Literature & Hypotheses Formulation

Green Knowledge Management

An organization's capacity to learn, retain, and apply knowledge is crucial for its growth, innovation, and sustainability (Widyanti et al., 2024). In literature, organizations leverage Knowledge Management (KM) to enhance customers' satisfaction and gain a competitive advantage in the market (Khan et al., 2024). Knowledge management (KM) plays a vital role in

enhancing organizational success (Al-Faouri, 2023). In this context, Green Knowledge Management (GKM) is the deliberate effort to tap into and utilize the valuable knowledge embedded within an organization's social framework, promoting eco-friendly practices and sustainability (Sahoo et al., 2024). Moreover, the focus of GKM is to integrate environmental awareness into knowledge management practices, thereby promoting sustainability and green initiatives (Ghorbani, 2023). It is imperative to note that GKM goes beyond just environmental information, encompassing a wide range of strategies and practices that promote sustainable development across ecological, social, and economic dimensions (Yu et al., 2022). In the opinion of Iliescu (2024), GKM evolves from researchers' endeavors to expand the knowledge management discipline by incorporating environmental sustainability goals, thereby broadening its scope and impact.

Meanwhile, GKM facilitates decision-making by providing useful environmental information (Al-Husain, 2025). Detailed information about the environment, such as pollution, waste, etc., and their impact on society tends to empower the management in decision-making. Knowledge management supports innovation, resulting in sustainable development (Qadeer & Rafi, 2024). The study of Abdelwahed et al. (2025) revealed that GKM constructs, including green knowledge acquisition, green knowledge dissemination, and green knowledge responsiveness, are positively and significantly correlated with green innovation. Furthermore, it was found that knowledge management influences green innovation and corporate sustainable development (Abbas & Sagsan, 2019). Effective knowledge management boosts green innovation, leading to sustainable performances (Cong, 2024). The study conducted by Weina and Yanling (2022) showed that knowledge management practices are closely linked to environmental sustainability, environmental awareness, and green technology adoption. This implies that knowledge management is crucial in supporting eco-friendly initiatives.

Employee Green Performance

Employee performance has grown in importance in modern organizations, especially where knowledge-based work is key (Berisha et al., 2025). Performance is a multidimensional concept that is often used without a clear definition (Ghalem et al., 2016). It refers to achieving specific tasks like accuracy, completeness, cost, and speed (Soressa & Zewdic, 2021). Therefore, employee green performance measures the level of involvement and commitment of employees in achieving cleaner production and environmental protection within an organization (Arulrajah et al., 2016). According to Hoang et al. (2025), it is referred to as the extent to which employees achieve their

assigned environmental task. The commitment of organizational members toward environmental protection and sustainability is referred to as green employee performance (Gomes et al., 2024). Encouraging green creativity is important in the evaluation of employees' green performance and organizational competitiveness (Saleem et al., 2024). The factors identified as affecting employees' green performance include organizational citizenship behavior for the environment (OCBE), green performance appraisal, and green compensation and rewards (Ardiza et al., 2021). Other factors include green training and development (Olaiya & Olaosebikan, 2022) and knowledge sharing and green organizational commitment (Yang & Li, 2023). This suggests that employee performance measures the behaviors or actions relevant to the attainment of an organization's green initiatives. Doing what an employee is paid for in an organization at the right time suggests performance (Ranta & Ylinen, 2024).

Green Knowledge Creation and Employee Green Performance

Knowledge has been recognized as an intangible asset that can be used as a source of competition in the market (Corcione et al., 2024; Ramirez et al., 2011). The success and/or the failure of any organization depends on the kind of knowledge created and shared within the organization (Abbas & Khan, 2023). Knowledge is a complex idea with different meanings (Agrifogli et al., 2021). Knowledge, or information that has been processed (Bratianu, 2015), can be classified into two types: explicit and tacit knowledge (Ibojo & Mobolade, 2023). Tacit knowledge is personal and held in individual minds, not documented or formalized (Gamble, 2020). It is the knowledge that exists but is not formalized or written down (Corcione et al., 2024). On the other hand, explicit knowledge is the type of knowledge that is codified and can be found in documents, manuals, or databases (Abbasi et al., 2019). This kind of knowledge has been formalized, communicated, and made understandable through some form of documentation or explanation (Corcione et al., 2024). However, it is believed that the knowledge possessed by individuals in the organization, both explicit and tacit, serves as a source of creating knowledge if shared. Transforming an individual's tacit knowledge into explicit knowledge at a group or organizational level leads to knowledge creation. Hence, green knowledge creation involves coming up with a fresh idea, thought, or information on environmental protection (Cong, 2024). Developing new ideas, discovering trends that were originally unidentified, combining different fields, and creating new processes are all examples of knowledge creation (Olubiyi et al., 2024). According to Lyles (2014), cited

in Nonaka et al. (2014), businesses can create knowledge internally through research and development or by coming up with novel approaches to problems. Three essential components of the knowledge management cycle are the generation of knowledge, transmission, and application (Adewuyi, 2021). The empirical study carried out by Ngoc Huynh et al. (2024) revealed that green knowledge management has a positive and significant effect on green innovation. Green knowledge sharing improves organizational performance (Khan et al., 2023).

H01: There is no significant positive relationship between knowledge creation and employees' green performance.

Green Knowledge Acquisition and Employee Green Performance

Knowledge acquisition is an important aspect of knowledge management (Brewster, Ciravegna & Wilks, 2001). This is because of its role in promoting innovation (Ngoc Thang & Anh Tuan, 2020) and green performance in the organization (Baquero, 2025). Information is a key; its proper management can enhance innovative ideas and a firm's sustainable competitive advantage (Nyuga & Tanova, 2024). SMEs require useful environmental information that aids strategic decision-making (Krakauer, 2016). These can be obtained from different sources: internal and external (Indris & Primiana, 2015). The capacity of a company to tap into different information sources to create green business insights that employees can use for strategic decision-making is referred to as green knowledge acquisition (Sahoo et al., 2022). It involves gaining and distributing knowledge focused on eco-friendly practices, principles, and technologies (Baquero, 2024). It is a process of obtaining knowledge from sources, organizing it, and disseminating it to a knowledge base and maybe into a system that uses it for reasoning (Aronson, 2003).

According to Gamble (2020), tacit knowledge helps organizations maintain a sustainable competitive edge since competitors can't easily duplicate it in their own context. Green knowledge acquisition has a positive impact on green knowledge management and technological innovation (Sahoo et al., 2022). There is a positive and significant effect of green acquisition on organizational performance (Ibojo & Mobolade, 2023). Acquiring technical knowledge from outside and gaining market knowledge both positively impact corporate green innovation (Guo, 2023). The study of Abu Rumman and Hiasat (2023) revealed that there is no positive significant influence of knowledge acquisition on green performance in private hospitals in Amman. Conversely, Ibojo and Mobolade (2023) posited that knowledge acquisition positively and significantly influences the organizational performance

of selected manufacturing firms in Oyo State, Nigeria. Knowledge management dimensions such as knowledge acquisition, dissemination, and application were found to positively influence sustainability development practices (Shahzad et al., 2021; Al-Faouri, 2023).

H02: There is no significant positive relationship between knowledge acquisition and employees' green performance.

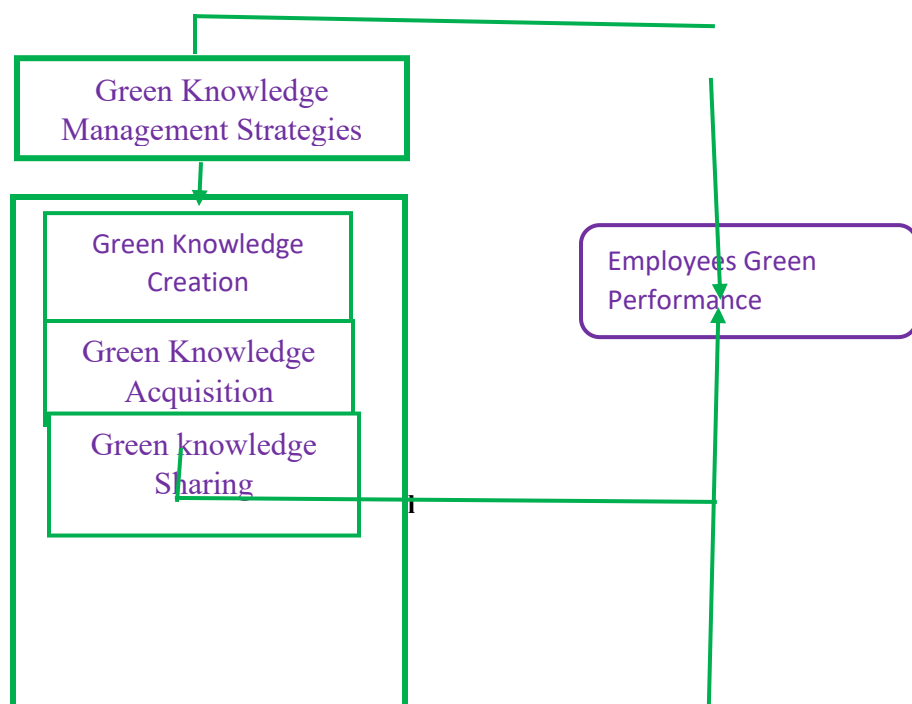
Green Knowledge Sharing and Employees' Green Performance

The goal of many businesses is the promotion of eco-friendly practices for organizational sustainability (Ansong et al., 2024). This requires dissemination of green knowledge. Green knowledge sharing is akin to knowledge application that enables employees to apply what they have been taught (Yu et al., 2022). In a green context, knowledge sharing means exchanging ideas, experiences, and best practices related to sustainability and protecting the environment among people in an organization (Ansong et al., 2024). Cross-sector partnerships and collaborative platforms play a big role in sharing knowledge, which is crucial for innovation in things like renewable energy and reducing waste (Saleem et al., 2024). Sharing knowledge entails individuals and groups exchanging knowledge and skills, which promotes a cooperative and learning-focused culture that is essential for creativity and problem-solving (Nazim & Mukherjee, 2016). Green knowledge sharing represents the extent to which eco-friendly information is being propagated (Khawaja & Janjua, 2025). The process of exchanging knowledge results in mutually dependent outcomes for both parties (Bratianu, 2015). By sharing knowledge about sustainable practices, organizations can innovate more efficiently, cutting down on time and resources needed for new green technologies or processes (Saleem et al., 2024). The result of the study carried out by Agrifogli et al. (2020) revealed that the implementation of green human resource management practices produces a positive effect on eco-friendly behavior and green performance with commitment mediating their relationships. Green performance is positively and significantly influenced by knowledge sharing with green creativity mediating (Saleem et al., 2024).

H03: There is no significant positive relationship between knowledge sharing and employees' green performance.

Conceptual Framework of Variables

Conceptual Framework: Figure 1 shows the link between green knowledge management strategies and employees' green performance.



This study adopted the descriptive survey design method. As Siedecki (2020) notes, descriptive surveys aim to accurately capture the characteristics of specific individuals, situations, or groups.

The population of this study is drawn from ten (10) selected SMEs in Anambra State. The total population of the employees in the firms was 1200. Applying the Krejcie and Morgan table (1970), 291 employees were selected from sampled SMEs in Anambra State. To collect primary data from the respondents, structured questionnaires made up of sections A and B were administered. Section A captured information relating to the respondent's biographical data, while Section B captured questions relating to the research hypotheses. Cronbach's alpha analysis was administered to obtain the reliability of the study instrument. Inferential analysis assists in understanding relationships between the study variables. In order to meet the research objectives of the study, all valid responses were assessed using Ordinary Least Square (OLS) multiple regression via the use of Statistical Package of Social Sciences (SPSS) version 22. OLS multiple regressions were used to predict whether there is any significant effect of the independent variables (knowledge creation, knowledge acquisition, and knowledge sharing) on the dependent variable (employee's green performance).

Model Specification and Estimation Strategy

This study is concerned with Green Knowledge Management Strategies (GKMS) and Employees' Green Performance (EGP).

$$EGP = f(GKMS) \text{-----(1)}$$

Green knowledge management strategies (GKMS) include; Green Knowledge Creation (GKC), Green Knowledge Acquisition (GKA) and Green Knowledge Sharing (GKS).

$$EGP = f(GKC, GKA, GKS) \text{----- (2)}$$

The multiple variate equation model is specified as;

$$EGP = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_n X_n + \mu \text{----- (3)}$$

The regression form of the models is stated as;

$$EGP = \beta_0 + \beta_1 GKC + \beta_2 GKA + \beta_3 GKS + \mu \text{----- (4)}$$

Result and Analysis

A total number of 291 questionnaires were distributed. Out of which, 230 was fully completed and retrieved accounting for 79% return rate

Table 1:

Socio-Economic Attributes of Participating Employees

Participants' Bio-Data	Responses	Rate (%)
Sex:		
Male:	144	63
Female:	86	37
Total:	230	100
Marital Status:		
Single:	115	50
Married:	110	48
Others:	5	2
Total	230	100
Qualifications:		
O'Level	34	15
ND/Equivalent:	65	28
B.Sc./Equivalent	120	52
Post Graduate	11	5
Total	230	100

Source: Field Survey, 2025

The data in table 1 above revealed that the number of males was 144, which accounted for 63%, while the number of females was 86, representing 37%. Their marital status showed that 115, which is 50%, were single; 110 were married, which is 48%; and 5 were either divorced or widowed, which represents 2%. On

qualifications, 34 were O'Level certificate holders, which is 15%; 65 were ND or its equivalent holders, representing 28%; 120 held a B.Sc. degree, which is 52%; and the number of postgraduate certificates was 11, which represents 5%.

Table 2: Multiple Regression Table

Coefficients ^a					
Model		Unstandardized Coefficients		Standardized Coefficients	
		B	Std. Error	Beta	
1	(Constant)	.846	.125		6.740
	Green Knowledge Creation	.138	.036	.153	3.820
	Green Knowledge Acquisition	.592	.055	.611	10.719
	Green Knowledge Sharing	.226	.060	.234	3.736

a. Dependent Variable: Employee Green Performance

Table 2 shows the multiple regression analysis results of the coefficient for the components of the effect of Green Knowledge Management Strategies on Employees' Green Performance of Small and Medium Enterprises (SMEs) in Anambra State. The results showed that green knowledge creation ($\beta = 0.138$, $t = 3.820$, and $p\text{-value} = 0.000 < 0.05$), green knowledge acquisition ($\beta = 0.592$, $t = 10.719$, and $p\text{-value} = 0.000 < 0.05$), and green knowledge sharing ($\beta = 0.226$, $t = 3.736$, and $p\text{-value} = 0.000 < 0.05$) all have a positive and significant effect on employees' green performance of small and medium enterprises (SMEs) in Anambra State.

Discussion of Findings

This study's objectives, as well as the hypotheses, have been tested using the appropriate statistical tools, and the findings are discussed below.

Hypothesis One

In line with the study's objective, which is to investigate the relationship between green knowledge creation and employees' green performance, a null hypothesis stating that there is no significant positive relationship between green knowledge creation and employees' green performance of selected SMEs in Anambra State was formulated. However, the result of the regression analysis ($\beta = 0.138$, $t = 3.820$, and $p\text{-value} = 0.000 < 0.05$) showed that there exists a positive and significant relationship between green knowledge creation and employees' green performance of SMEs in Anambra State. This invalidates the null hypothesis, thereby accepting the alternative hypothesis. By implication, the more green knowledge is being created, the more employees' green performance is being enhanced by 1.4%, since the beta value is $\beta = 0.138$. The reverse is the case of not creating green knowledge in the system. Therefore, an increase in the creation of green knowledge correlates with improved employees' knowledge, capacity to make informed decisions, problem-solving, and most importantly, innovation. This study conforms to the empirical study of Ngoc Huynh et al. (2024), who posited that knowledge management has a positive significant effect on green innovation. By creating knowledge, SMEs are equipped with the capacity to gain competitive advantage, creative and innovative ideas, and adaptation to changing business environments.

Hypothesis Two

The second objective examined the relationship between knowledge acquisition and employees' green performance, accompanied by the null hypothesis stating that there is no significant positive relationship between knowledge acquisition and employees' green

performance of selected SMEs in Anambra State. However, the regression result ($\beta = 0.592$, $t = 10.719$, and $p\text{-value} = 0.000 < 0.05$) revealed that there is a positive and significant relationship between green knowledge acquisition and employees' green performance of selected SMEs in Anambra State. This led to the decision of rejecting the null hypothesis and the acceptance of the alternative hypothesis, which states that there is a positive and significant relationship between green knowledge acquisition and employee green performance. This indicates that an increase in green knowledge acquisition in the organization correlates with improved employee green performance output, suggesting that extra green knowledge acquired by employees will lead to improvement in their green performance by 5.92% since the beta value is $\beta = 0.592$, and vice versa. This aligns with the study carried out by Ibojo and Mobolade (2023), who posited that knowledge acquisition positively and significantly influences the organizational performance of selected manufacturing firms in Oyo State, Nigeria. Similarly, knowledge management dimensions such as knowledge acquisition, dissemination, and application were found to positively influence sustainability development practices (Shahzad et al., 2021; Al-Faouri, 2023).

Hypothesis Three

Objective three evaluated the relationship between green knowledge sharing and employees' green performance. This was followed by the null hypothesis stating that there is no significant positive relationship between green knowledge sharing and employees' green performance in selected SMEs in Anambra State. Meanwhile, the regression result ($\beta = 0.226$, $t = 3.736$, and $p\text{-value} = 0.000 < 0.05$) revealed that there exists a positive and significant relationship between green knowledge sharing and employees' green performance. This led to a decision to reject the null hypothesis and accept the alternative hypothesis, which states that a significant positive relationship exists between green knowledge sharing and employees' green performance. By implication, an increase in green knowledge sharing within the organization correlates with improved employees' green performance output, suggesting that extra green knowledge shared within the organization will lead to a 2.3% improvement in employees' green performance and vice versa. This study is in agreement with the study carried out by Agrifogli et al. (2020), who opined that the implementation of green human resource management practices will produce a positive effect on eco-friendly behavior and green performance. Green performance is positively and significantly influenced by knowledge

sharing with green creativity mediating (Saleem et al., 2024).

Summary of findings

1. Green knowledge creation has a significant influence on employees' green performance of SMEs in Anambra State. The result of green knowledge creation ($\beta = 0.138$, $t = 3.820$, and $p\text{-value} = 0.000 < 0.05$) showed that for each unit increase in green knowledge creation, employees' green performance is estimated to increase by 0.138 units.

2. Green knowledge acquisition has a significant impact on employees' green performance at SMEs in Anambra State. The result of green knowledge acquisition ($\beta = 0.592$, $t = 10.719$, and $p\text{-value} = 0.000 < 0.05$) showed that for each unit decrease in green knowledge acquisition, employees' green performance is estimated to decrease by 0.592 units.

3. There is a significant relationship between green knowledge sharing and employees' green performance of SMEs in Anambra State. The result of green knowledge sharing ($\beta = 0.226$, $t = 3.736$, and $p\text{-value} = 0.000 < 0.05$) showed that for each unit increase in green knowledge sharing, employees' green performance is estimated to increase by 0.592 units.

Conclusion

Knowledge is a resource within the organization that can be used to gain a competitive advantage. This is because of its inability to be imitated. As environmental challenges persist, green knowledge management is required of organizations, particularly SMEs in Anambra State, to enhance their employees' green performance for sustainable economic development.

Based on the findings of this study, green knowledge management strategies, such as green knowledge creation, green knowledge acquisition, and green knowledge sharing, all have a positive significant effect on employees' green performance at SMEs in Anambra State. Therefore, the government should formulate policies that will encourage SMEs to create, acquire, and share green knowledge. This will lead to employees' innovation, which results in eco-friendly practices and sustainability of the business and its environment.

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